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Sequence Listing was accepted.

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Reviewer: markspencer

Timestamp: [year=2008; month=5; day=9; hr=14; min=8; sec=39; ms=591;]

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Application No: 10527438 Version No: 3.0

Input Set:

Output Set:

Started: 2008-04-22 17:19:20.659
Finished: 2008-04-22 17:19:21.455
Elapsed: 0 hr(s) 0 min(s) 0 sec(s) 796 ms
Total Warnings: 11
Total Errors: 0
No. of SeqIDs Defined: 19
Actual SeqID Count: 19

Error code	Error Description
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W 213	Artificial or Unknown found in <213> in SEQ ID (2)
W 213	Artificial or Unknown found in <213> in SEQ ID (3)
W 213	Artificial or Unknown found in <213> in SEQ ID (4)
W 213	Artificial or Unknown found in <213> in SEQ ID (5)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
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W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (18)

<110> Korea Research Institute of Bioscience and Biotechnology
<120> Method for screening of a lipase having improved enzymatic activity using yeast surface display vector and the lipase
<130> 26666U
<140> 10527438
<141> 2005-03-11

<150> KR 2002-55575
<151> 2002-09-13

<160> 19

<170> KopatentIn 1.71

<210> 1
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> CALB primer 1

<400> 1
ggctcttcag ccactccttt ggtgaag

27

<210> 2
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> CALB primer 2

<400> 2
gcggatcctc agggggtgac gat

23

<210> 3
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> CALB primer 3

<400> 3
gcggatccgg ggggtgacgat gccggag

27

<210> 4

<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> GPD-err primer

<400> 4
gcagagctaa ccaataagg 19

<210> 5
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> T-0 primer

<400> 5
tgcagttgaa cacaaccac 19

<210> 6
<211> 1023
<212> DNA
<213> Candida antarctica

<220>
<221> sig_peptide
<222> (1)..(51)
<223> secretion signal

<400> 6
atgaatatat ttacatatt tttgtttttg ctgtcattcg ttcaaggtag cgccactccc 60
ttggtgaagc gtctgccttc cggttcggac cctgcctttt cgcagcccaa gtcggtgctc 120
gatgcgggtc tgacctgcca ggggtgcttcg ccatacctcgg tctccaaacc catecttctc 180
gtccccggaa ccggcaccac aggtccacag tcgttcgact cgaactggat cccctctct 240
gcgcagctgg gttacacacc ctgctggatc tcacccccgc cgttcattgct caacgacacc 300
caggtcaaca cggagtacat ggtcaacgcc atcaccacgc tctacgctgg ttcgggcaac 360
aacaagcttc ccgtgctcac ctgggtcccag ggtggtctgg ttgcacagtg ggggtctgacc 420
ttcttcccca gtatcaggtc caaggctgat cgacttatgg cctttgcgcc cgactacaag 480
ggcaccgtcc tcgcggccc tctcgatgca ctgcgggta gtgcaccctc cgtatggcag 540
caaaccaccg gttcggcact cactaccgca ctccgaaacg caggtggtct gaccagatc 600

gtgccaccca ccaacctcta ctcggcgacc gacgagatcg ttcagcctca ggtgtccaac	660
tcgccactcg actcactcta cctcttcaac gggaagaacg tccaggcaca ggctgtgtgt	720
gggccgctgt tcgtcatcga ccatgcaggc tcgctcacct cgcagttctc ctacgtcgtc	780
ggtcgatccg cctgcgctc caccacgggc caggctcgta gtgcagacta tggcattacc	840
gactgcaacc ctcttccgc caatgatctg actcccgagc aaaaggtcgc cgcggctgcg	900
ctcccggcgc cggcggtgc agccatcgta gcgggtccaa agcagaactg cgagcccgac	960
ctcatgccct acgcccgcct ctttgcagta ggcaaaagga cctgctccgg catcgtcacc	1020
ccc	1023

<210> 7
 <211> 1023
 <212> DNA
 <213> Candida antarctica

<220>
 <221> sig_peptide
 <222> (1)..(51)
 <223> secretion signal

<400> 7	
atgaatatat ttacatatt ttgtttttg ctgtcattcg ttcaaggtag cgccactcct	60
ttggtgaagc gtctgccttc cggttcggac cctgcctttt cgcagcccaa gtcggtgctc	120
gatgcgggtc tgacctgcca aggtgcttcg ccactctcgg tctccaaacc catccttctc	180
gtccccggaa cgggcaccac aggtccacag tcgttcgact cgaactggat cccctctct	240
gcgcagctgg gttacacacc ctgctggatc tcacccccgc cgttcattgt caacgacacc	300
cagggtcaaca cggagtacat ggtcaacgcc atcaccacgc tctacgctgg ttccgggcaac	360
aacaagcttc ccgtgctcac ctggtcccag ggtggtctgg ttgcacagtg gggctctgacc	420
ttcttcccca gtatcaggtc caaggctgat cgacttatgg cctttgcgcc cgactacaag	480
ggcacctgcc tcgccggccc tctcgatgca ctccgggtta gtgcaccctc cgtatggcag	540
caaaccaccg gttcggcact cactaccgca ctccgaaacg cagggtgtct gaccagatc	600
gtgccaccca ccaacctcta ctcggcgacc gacgagatcg ttcagcctca ggtgtccaac	660
tcgccactcg actcactcta ccttttcaac ggaaagaacg tccaggcaca ggctgtgtgt	720
gggccgcagt tcgtcatcga ccatgcaggc tcgctcacct cgcagttctc ctacgtcgtc	780
ggtcgatccg cctgcgctc caccacgggc caggctcgta gtgcggacta tggcattacg	840

gactgcaacc ctcttcccgc caatgatctg actcccgagc aaaaggctcg cgcggtgctgcg	900
ctcccgggcg cgggcggtgc agccatcgctg gcgggtccaa agcagaactg cgagcccgcac	960
ctcatgccct acgcccgcct ctttgcagta ggcaaaagga cctgctccgg catcgtcacc	1020
ccc	1023

<210> 8
 <211> 1023
 <212> DNA
 <213> Candida antarctica

<220>
 <221> sig_peptide
 <222> (1)..(51)
 <223> secretion signal

<400> 8	
atgaatatat ttacatatt tttgtttttg ctgtcattcg ttcaaggtag cgccactcct	60
ttggtgaagc gtctgccttc cggttcggac cctgcctttt cgcagcccaa gtcggtgctc	120
gatgcgggtc tgacctgcca ggggtgcttcg ccatacctcg tctccaaacc catccttctc	180
gtccccggaa cgggcaccac aggtccacag tcgttcgact cgaactggat cccctctct	240
gcgcagctgg gttacacacc ctgctggatc tcacccccgc cgttcattgct caacgacacc	300
cagggtcaaca cggagtacat ggtcaacgcc atcaccacgc tctacgctgg ttcgggcaac	360
aacaagcttc ccgtgctcac ctgggccag ggtggtctgg ttgcacagtg gggctctgacc	420
ttcttcccca gtatcaggct caaggctgat cgacttatgg cctttgcgcc cgactacaag	480
ggcaccgtcc tcgcccggccc tctcgatgca ctgcggtta gtgcaccctc cgtatggcag	540
caaaccaccg gttcggcact cactaccgca ctccgaaacg cagggtgtct gaccagatc	600
gtgcccacca ccaacctcta ctcggcgacc gacgagatcg ttcagcctca ggtgtccaac	660
tcgccactcg actcactcta cctcttcaac ggaaagaacg tccaggcaca ggctgtgtgt	720
gggccgcagt tcgtcatcga ccatacaggc tcgtcacct cgagttctc ctacgtcgtc	780
ggtcgatccg cctgcgctc caccacgggc caggctcgta gtgcagacta tggcattacg	840
gactgcaacc ctcttcccgc caatgatctg actcccgagc aaaaggctcg cgcggtgctgcg	900
ctcctggcgcg cgggcggtgc agccatcgctg gcgggtccaa agcagaactg cgagcccgcac	960
ctcatgccct acgcccgcct ctttgcagta ggcaaaagga cctgctccgg catcgtcacc	1020
ccc	1023

<210> 9
<211> 343
<212> PRT
<213> Candida antarctica

<220>
<221> SIGNAL
<222> (1)..(17)
<223> secretion signal

<400> 9
Met Asn Ile Phe Tyr Ile Phe Leu Phe Leu Leu Ser Phe Val Gln Gly
1 5 10 15

Thr Ala Thr Pro Leu Val Lys Arg Leu Pro Ser Gly Ser Asp Pro Ala
20 25 30

Phe Ser Gln Pro Lys Ser Val Leu Asp Ala Gly Leu Thr Cys Gln Gly
35 40 45

Ala Ser Pro Ser Ser Val Ser Lys Pro Ile Leu Leu Val Pro Gly Thr
50 55 60

Gly Thr Thr Gly Pro Gln Ser Phe Asp Ser Asn Trp Ile Pro Leu Ser
65 70 75 80

Ala Gln Leu Gly Tyr Thr Pro Cys Trp Ile Ser Pro Pro Pro Phe Met
85 90 95

Leu Asn Asp Thr Gln Val Asn Thr Glu Tyr Met Val Asn Ala Ile Thr
100 105 110

Thr Leu Tyr Ala Gly Ser Gly Asn Asn Lys Leu Pro Val Leu Thr Trp
115 120 125

Ser Gln Gly Gly Leu Val Ala Gln Trp Gly Leu Thr Phe Phe Pro Ser
130 135 140

Ile Arg Ser Lys Val Asp Arg Leu Met Ala Phe Ala Pro Asp Tyr Lys
145 150 155 160

Gly Thr Val Leu Ala Gly Pro Leu Asp Ala Leu Ala Val Ser Ala Pro
165 170 175

Ser Val Trp Gln Gln Thr Thr Gly Ser Ala Leu Thr Thr Ala Leu Arg
180 185 190

Asn Ala Gly Gly Leu Thr Gln Ile Val Pro Thr Thr Asn Leu Tyr Ser
195 200 205

Ala Thr Asp Glu Ile Val Gln Pro Gln Val Ser Asn Ser Pro Leu Asp
210 215 220

Ser Ser Tyr Leu Phe Asn Gly Lys Asn Val Gln Ala Gln Ala Val Cys
225 230 235 240

Gly Pro Leu Phe Val Ile Asp His Ala Gly Ser Leu Thr Ser Gln Phe
 245 250 255
 Ser Tyr Val Val Gly Arg Ser Ala Leu Arg Ser Thr Thr Gly Gln Ala
 260 265 270
 Arg Ser Ala Asp Tyr Gly Ile Thr Asp Cys Asn Pro Leu Pro Ala Asn
 275 280 285
 Asp Leu Thr Pro Glu Gln Lys Val Ala Ala Ala Ala Leu Pro Ala Pro
 290 295 300
 Ala Ala Ala Ala Ile Val Ala Gly Pro Lys Gln Asn Cys Glu Pro Asp
 305 310 315 320
 Leu Met Pro Tyr Ala Arg Pro Phe Ala Val Gly Lys Arg Thr Cys Ser
 325 330 335
 Gly Ile Val Thr Pro Gly Ser
 340

<210> 10
 <211> 343
 <212> PRT
 <213> Candida antarctica

<220>
 <221> SIGNAL
 <222> (1)..(17)
 <223> secretion signal

<400> 10
 Met Asn Ile Phe Tyr Ile Phe Leu Phe Leu Leu Ser Phe Val Gln Gly
 1 5 10 15
 Thr Ala Thr Pro Leu Val Lys Arg Leu Pro Ser Gly Ser Asp Pro Ala
 20 25 30
 Phe Ser Gln Pro Lys Ser Val Leu Asp Ala Gly Leu Thr Cys Gln Gly
 35 40 45
 Ala Ser Pro Ser Ser Val Ser Lys Pro Ile Leu Leu Val Pro Gly Thr
 50 55 60
 Gly Thr Thr Gly Pro Gln Ser Phe Asp Ser Asn Trp Ile Pro Leu Ser
 65 70 75 80
 Ala Gln Leu Gly Tyr Thr Pro Cys Trp Ile Ser Pro Pro Pro Phe Met
 85 90 95
 Leu Asn Asp Thr Gln Val Asn Thr Glu Tyr Met Val Asn Ala Ile Thr
 100 105 110
 Thr Leu Tyr Ala Gly Ser Gly Asn Asn Lys Leu Pro Val Leu Thr Trp

115	120	125
Ser Gln Gly Gly Leu Val Ala Gln Trp Gly Leu Thr Phe Phe Pro Ser		
130	135	140
Ile Arg Ser Lys Val Asp Arg Leu Met Ala Phe Ala Pro Asp Tyr Lys		
145	150	155
		160
Gly Thr Val Leu Ala Gly Pro Leu Asp Ala Leu Ala Val Ser Ala Pro		
	165	170
		175
Ser Val Trp Gln Gln Thr Thr Gly Ser Ala Leu Thr Thr Ala Leu Arg		
	180	185
		190
Asn Ala Gly Gly Leu Thr Gln Ile Val Pro Thr Thr Asn Leu Tyr Ser		
	195	200
		205
Ala Thr Asp Glu Ile Val Gln Pro Gln Val Ser Asn Ser Pro Leu Asp		
	210	215
		220
Ser Ser Tyr Leu Phe Asn Gly Lys Asn Val Gln Ala Gln Ala Val Cys		
225	230	235
		240
Gly Pro Gln Phe Val Ile Asp His Ala Gly Ser Leu Thr Ser Gln Phe		
	245	250
		255
Ser Tyr Val Val Gly Arg Ser Ala Leu Arg Ser Thr Thr Gly Gln Ala		
	260	265
		270
Arg Ser Ala Asp Tyr Gly Ile Thr Asp Cys Asn Pro Leu Pro Ala Asn		
	275	280
		285
Asp Leu Thr Pro Glu Gln Lys Val Ala Ala Ala Ala Leu Pro Ala Pro		
	290	295
		300
Ala Ala Ala Ala Ile Val Ala Gly Pro Lys Gln Asn Cys Glu Pro Asp		
305	310	315
		320
Leu Met Pro Tyr Ala Arg Pro Phe Ala Val Gly Lys Arg Thr Cys Ser		
	325	330
		335
Gly Ile Val Thr Pro Gly Ser		
	340	

<210> 11
 <211> 341
 <212> PRT
 <213> Candida antarctica

<220>
 <221> SIGNAL
 <222> (1)..(24)
 <223> secretion signal

<400> 11

Met	Asn	Ile	Phe	Tyr	Ile	Phe	Leu	Phe	Leu	Leu	Ser	Phe	Val	Gln	Gly	1	5	10	15
Thr	Ala	Thr	Pro	Leu	Val	Lys	Arg	Leu	Pro	Ser	Gly	Ser	Asp	Pro	Ala	20	25	30	
Phe	Ser	Gln	Pro	Lys	Ser	Val	Leu	Asp	Ala	Gly	Leu	Thr	Cys	Gln	Gly	35	40	45	
Ala	Ser	Pro	Ser	Ser	Val	Ser	Lys	Pro	Ile	Leu	Leu	Val	Pro	Gly	Thr	50	55	60	
Gly	Thr	Thr	Gly	Pro	Gln	Ser	Phe	Asp	Ser	Asn	Trp	Ile	Pro	Leu	Ser	65	70	75	80
Ala	Gln	Leu	Gly	Tyr	Thr	Pro	Cys	Trp	Ile	Ser	Pro	Pro	Pro	Phe	Met	85	90	95	
Leu	Asn	Asp	Thr	Gln	Val	Asn	Thr	Glu	Tyr	Met	Val	Asn	Ala	Ile	Thr	100	105	110	
Thr	Leu	Tyr	Ala	Gly	Ser	Gly	Asn	Asn	Lys	Leu	Pro	Val	Leu	Thr	Trp	115	120	125	
Ser	Gln	Gly	Gly	Leu	Val	Ala	Gln	Trp	Gly	Leu	Thr	Phe	Phe	Pro	Ser	130	135	140	
Ile	Arg	Ser	Lys	Val	Asp	Arg	Leu	Met	Ala	Phe	Ala	Pro	Asp	Tyr	Lys	145	150	155	160
Gly	Thr	Val	Leu	Ala	Gly	Pro	Leu	Asp	Ala	Leu	Ala	Val	Ser	Ala	Pro	165	170	175	
Ser	Val	Trp	Gln	Gln	Thr	Thr	Gly	Ser	Ala	Leu	Thr	Thr	Ala	Leu	Arg	180	185	190	
Asn	Ala	Gly	Gly	Leu	Thr	Gln	Ile	Val	Pro	Thr	Thr	Asn	Leu	Tyr	Ser	195	200	205	
Ala	Thr	Asp	Glu	Ile	Val	Gln	Pro	Gln	Val	Ser	Asn	Ser	Pro	Leu	Asp	210	215	220	
Ser	Ser	Tyr	Leu	Phe	Asn	Gly	Lys	Asn	Val	Gln	Ala	Gln	Ala	Val	Cys	225	230	235	240
Gly	Pro	Gln	Phe	Val	Ile	Asp	His	Ala	Gly	Ser	Leu	Thr	Ser	Gln	Phe	245	250	255	
Ser	Tyr	Val	Val	Gly	Arg	Ser	Ala	Leu	Arg	Ser	Thr	Thr	Gly	Gln	Ala	260	265	270	
Arg	Ser	Ala	Asp	Tyr	Gly	Ile	Thr	Asp	Cys	Asn	Pro	Leu	Pro	Ala	Asn	275	280	285	
Asp	Leu	Thr	Pro	Glu	Gln	Lys	Val	Ala	Ala	Ala	Ala	Leu	Leu	Ala	Pro	290	295	300	

Ala Ala Ala Ala Ile Val Ala Gly Pro Lys Gln Asn Cys Glu Pro Asp
305 310 315 320

Leu Met Pro Tyr Ala Arg Pro Phe Ala Val Gly Lys Arg Thr Cys Ser
325 330 335

Gly Ile Val Thr Pro
340

<210> 12
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> CALB primer 4

<400> 12
ctcatatgct accttccggt tcggac

26

<210> 13
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> a-amylase secretion signal

<400> 13
Met Met Val Ala Trp Trp Ser Leu Phe Leu Tyr Gly Leu Gln Val Ala
1 5 10 15

Ala Pro Ala Leu Ala
20

<210> 14
<211> 317
<212> PRT
<213> Candida antarctica

<400> 14
Leu Pro Ser Gly Ser Asp Pro Ala Phe Ser Gln Pro Lys Ser Val Leu
1 5 10 15

Asp Ala Gly Leu Thr Cys Gln Gly Ala Ser Pro Ser Ser Val Ser Lys
20 25 30

Pro Ile Leu Leu Val Pro Gly Thr Gly Thr Thr Gly Pro Gln Ser Phe
35 40 45

Asp Ser Asn Trp Ile Pro Leu Ser Ala Gln Leu Gly Tyr Thr Pro Cys
50 55 60

Trp Ile Ser Pro Pro Pro Phe Met Leu Asn Asp Thr Gln Val Asn Thr
65 70 75 80

Glu Tyr Met Val Asn Ala Ile Thr Thr Leu Tyr Ala Gly Ser Gly Asn
85 90 95

Asn Lys Leu Pro Val Leu Thr Trp Ser Gln Gly Gly Leu Val Ala Gln
100 105 110

Trp Gly Leu Thr Phe Phe Pro Ser Ile Arg Ser Lys Val Asp Arg Leu
115 120 125

Met Ala Phe Ala Pro Asp Tyr Lys Gly Thr Val Leu Ala Gly Pro Leu
130 135 140

Asp Ala Leu Ala Val Ser Ala Pro Ser Val Trp Gln Gln Thr Thr Gly
145 150 155 160

Ser Ala Leu Thr Thr Ala Leu Arg Asn Ala Gly Gly Leu Thr Gln Ile
165 170 175

Val Pro Thr Thr Asn Leu Tyr Ser Ala Thr Asp Glu Ile Val Gln Pro
180 185 190

Gln Val Ser Asn Ser Pro Leu Asp Ser Ser Tyr Leu Phe Asn Gly Lys
195 200 205

Asn Val Gln Ala Gln Ala Val Cys Gly Pro Leu Phe Val Ile Asp His
210 215 220

Ala Gly Ser Leu Thr Ser Gln Phe Ser Tyr Val Val Gly Arg Ser Ala
225 230 235 240

Leu Arg Ser Thr Thr Gly Gln Ala Arg Ser Ala Asp Tyr Gly Ile Thr
245 250 255

Asp Cys Asn Pro Leu Pro Ala Asn Asp Leu Thr Pro Glu Gln Lys Val
260 265 270

Ala Ala Ala Ala Leu Leu Ala Pro Ala Ala Ala Ala Ile Val Ala Gly
275 280 285

Pro Lys Gln Asn Cys Glu Pro Asp Leu Met Pro Tyr Ala Arg Pro Phe
290 295 300

Ala Val Gly Lys Arg Thr Cys Ser Gly Ile Val Thr Pro
305 310 31